

# Yuqun Wu

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Personal Website: <https://yuqunw.github.io>

## EDUCATION

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### University of Illinois at Urbana-Champaign

*Doctor of Philosophy in Computer Science*

Champaign, USA

*Aug 2023 - Present*

- Advisor: Prof. Derek Hoiem

*Master of Science in Computer Science (thesis)*

*Aug 2022 - May 2023*

- Advisor: Prof. Derek Hoiem, Prof. Shenlong Wang

*Bachelor of Science in Computer Science & Statistics*

*Jan 2020 - Dec 2021*

- Highest Honors at graduation, Dean's list for all years, GPA: 4.0/4.0

### Sun Yat-sen University

*Bachelor of Science in Mathematics*

Guangzhou, China

*Sep 2016 - Dec 2019*

## RESEARCH EXPERIENCE

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### University of Illinois at Urbana-Champaign

Champaign, USA

#### Unified indoor 3D scene representation

*Apr 2024 - Present*

Advisor: Prof. Derek Hoiem, Prof. Shenlong Wang

- Project targets at building an unified indoor 3D scene that enables rendering and 3D Q&A
- Investigate different representation and the performance and potential of heuristic methods

#### Region-based Representations Revisited

*Sep 2023 - Nov 2023*

Advisor: Prof. Derek Hoiem - *CVPR 2024*

- Project targeted at investigating new representation by combining SAM regions and dense features to solve various vision tasks, including semantic segmentation, object retrieval, video classification, and scene segmentation
- Responsible for implementation of feature extraction and pooling pipelines, and scene segmentation application on ScanNet

#### Improving Neural Radiance Fields with Patch-based Monocular Guidance

*Jan 2023 - May 2023*

Advisor: Prof. Derek Hoiem, Prof. Shenlong Wang - *Under Review*

- Project aimed to create 3D models that provide accurate geometry and view synthesis, partially closing the large geometric performance gap between NeRF and traditional MVS methods
- Proposed appearance regularization of normalized cross-correlation (NCC) and structural similarity (SSIM) between randomly sampled novel and training view to improve general performance

#### Plenoptic PNG: Real-Time Neural Radiance Fields in 150 KB

*Aug 2022 - Dec 2023*

Advisor: Prof. Derek Hoiem, Prof. Shenlong Wang - *Under Review*

- Project presented Quantized Fourier Features, which encoded a 3D scene into an extremely compact representation from 2D images and enabled its transmittance, decoding, and rendering in real-time across various platforms.
- Assisted in blending Quantized Fourier Features into different network setups, running experiments, and writing the paper.

#### Sparse SPN: Depth Completion from Sparse Keypoints

*Sep 2021 - Nov 2022*

Advisor: Prof. Derek Hoiem

- Project draw attention to single view depth completion taking point cloud from SfM as input
- Proposed a novel method that outperforms existing depth completion pipelines given sparse keypoint depth, and reconstructed complete point clouds given SfM setup

**GRIT: General Robust Image Task Benchmark**

*Jun 2021 - Aug 2021*

*Advisor: Prof. Derek Hoiem*

- Rendered surface normal of object-centric and scene-centric datasets, and split them into training, validation, and testing sets
- Trained a baseline network with training sets, and compare it with several other pretrained state-of-the-art normal estimation networks with testing sets
- Challenge Organizer of the 2nd workshop on Open World Vision of CVPR 2022

**University of California San Diego**

Remote

**Lighting completion from sparse lighting samples**

*Jun 2022 - Sep 2022*

*Advisor: Prof. Manmohan Chandraker*

- Project aims at recovering per-pixel spatially-varying lighting maps taking single color image and sparse lighting samples
- Investigated 2D lighting completion methods with differentiable rendering and compare to pure RGB-based estimation networks

**ACTIVITIES**

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**Conference Reviewer**

Champaign, USA

*ECCV, WACV*

*2024*

**Teaching Assistant**

Champaign, USA

*University of Illinois at Urbana-Champaign*

*Aug 2022 - May 2023*

- Course: *CS 445 Computational Photography, CS 441 Applied Machine Learning*

**Summer Research Experience for Undergraduates (REU)**

Champaign, USA

*University of Illinois at Urbana-Champaign*

*May 2021 - Aug 2021*

- Attended weekly seminars covering research skills, presentation skills

**SKILLS**

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- **Programming Languages:** Python, C/C++, JavaScript, R
- **Other Tools:** Git, Pytorch, Latex